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Author (s): Khalid Hussain¹, Rafiullah Sheikh², Abdul Qayyum³, and Sana Naseer Abbasi¹

Affiliation (s): ¹Bahria Business School, Bahria University Islamabad, Pakistan

²Riphah International University, Islamabad, Pakistan

³University of Sargodha, Sargodha, Pakistan

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Macroeconomic Conditions as Determinants of Profitability and Risk: A Comparison of Islamic and Conventional Banks in Pakistan

Khalid Hussain^{1*}, Rafiullah Sheikh², Abdul Qayyum³, and Sana Naseer Abbasi¹

¹Bahria Business School, Bahria University Islamabad, Pakistan

²Riphah International University, Islamabad, Pakistan

³University of Sargodha, Pakistan

Abstract

The current study aims to investigate the association between macroeconomic factors and Islamic and conventional banks' profitability, technical efficiency, and credit risk in the context of Pakistan. The sample size comprised four Islamic banks and four conventional banks in Pakistan. Data was collected for a period of ten years (2009-2018). To calculate technical efficiency, Data Envelopment Analysis (DEA) method was employed. Profitability was measured through Return on Assets (ROA) and credit risk through Debt to Asset Ratio (DAR). The results of regression estimation showed that generally, all economic variables had the same impact on both Islamic and conventional banks' profitability, efficiency, and credit risk. However, interest rate showed an opposite impact on both bank types. It was found that interest rate improves the profitability of conventional banks, while it has an adverse impact on Islamic banks' profitability. Moreover, interest rate improves the efficiency and increases the risk incurred by conventional banks, whereas its impact on the efficiency and risk of Islamic banks is not significant. The current study reveals certain differences in how these institutions respond to macroeconomic conditions. It helps to highlight the resilience or vulnerability of each banking system to economic fluctuations, providing practical implications for policymakers and practitioners both in Pakistan and in other Islamic finance markets.

Keywords: conventional banks, credit risk, interest rate, Islamic banks, macroeconomic conditions, profitability, technical efficiency

Introduction

Bank is a financial institution which is licensed to receive deposits and make loans. Banks can generate credit several times more than their actual deposits. This ability of credit creation leads to credit booms which make a

*Corresponding Author: Khussain.buic@bahria.edu.pk

financial system vulnerable to default risk (Turner, [2012](#)). On the other hand, economic activities and growth influence the banks to control credit creation, accordingly. Banks are likely to be more profitable when they issue more credit (Oino, [2021](#)). During economic downturns, the probability of loan default increases which triggers the bank default risk (Yu et al., [2022](#)).

Islamic banks have a different capital structure and asset class. The unique business model of Islamic banks poses a different risk pattern and responds differently to economic changes (Ariss, [2010](#); Hussain & Muhammad, [2022](#)). The ideologies of Islamic and conventional banks are different. Thus, while Islamic banks function analogous to interest-based or conventional banks, they are based on totally different models. Islamic banks are based on the principles of the *Shariah*. Mostly, they perform trade-based activities and act according to the mechanism of Profit and Loss Sharing (PLS). Moreover, they also boost the payments system to foster economic growth and development. Due to these differences, it is unfair to formulate identical aspects of effectiveness for the two different types of banks (Badreldin, [2009](#)).

Global Islamic banking assets reached USD 3.06 trillion by the end of 2021. The share of Islamic banking was 68.7%, amounting USD 2.10 trillion. Pakistan is one of the largest Muslim countries in the world where the majority of the population is Muslim. Pakistan came into being in 1947 in the name of Islam. In 1948, Quaid-e-Azam Muhammad Ali Jinnah said on the opening ceremony of the central bank of Pakistan, “We must work our destiny in our own way and present to the World an economic system based on true Islamic concept of Equality of manhood and social justice.” Lee and Ulla ([2011](#)) recorded that in Pakistan, Islamic banking started at the end of 1960s. This was the same period in which the majority of Muslim countries started Islamic banking. In Pakistan, the share of Islamic banking is increasing gradually. Currently, the share of Islamic banking in total banking assets is 16.6%. The State Bank of Pakistan (SBP) has announced a strategic plan to increase the share of Islamic banking upto 30% by 2025.

Changes in the economic conditions of a country always influence the performance and risks taken by banks. Changes in interest rate and exchange rate directly affect the banking business’s profitability, while the effect of other macroeconomic variables may be indirect. The cost of deposits and yield on bank loans depends on the interest rate, whereas

exchange rate also determines the cost of foreign liabilities and returns from foreign assets. Islamic banks claim that interest rate is only used for the benchmarking of the products, however, rate of return risk of Islamic banks is different from their conventional counterparts due to their investment activities (van Greuning & Iqbal, [2008](#); Zainol & Kassim, [2010](#)).

Islamic banking industry claims to follow a unique business model which is directly associated with economic activities. It was also recorded that Islamic banks are more stable and can absorb the shocks arising from economic and financial meltdowns (Hussain & Malik, [2022](#); Kasri & Azzahra, [2020](#); Tabash & Dhankar, [2014](#)). Islamic banks attempt to produce a satisfying financial advantage for depositors as well as a lucrative outcome for their shareholders (Alharbi, [2017](#)). Banks cannot, however, control macroeconomic factors. Under certain conditions, Islamic banks are unable to provide their clients with satisfactory financial results. From the standpoint of depositors and management, understanding the impact of macroeconomic factors is important to estimate the expected earnings.

The current study aims to investigate whether there is any significant difference in the risk, efficiency, and profitability of Islamic and conventional banks in Pakistan with respect to the impact of GDP, inflation and interest rate. A number of studies have been conducted to determine the impact of macroeconomic variables on conventional or Islamic banks without making any comparison between them. Thus, comparatively examining the relationship between macroeconomic conditions, risk, and profitability in both types of banks may offer insights into effective risk management strategies. This is crucial for the sustainability and resilience of financial institutions. The current study may contribute to the development of best practices in risk management, particularly in the context of Islamic banking.

The remainder of this study is organized as follows: Section 2 summarizes the relevant literature review. Section 3 explains the research methods employed in the current study. Section 4 presents the results and discussion. Finally, Section 5 concludes the findings and also states the implications and limitations of the study.

Literature Review

Impact of Macroeconomic Variables on Conventional Banks

The relationship between macroeconomic factors and banking

industry's risk and performance has been the focus of research since long (Chen et al., [2018](#); Derbali, [2012](#); Nasserinia et al., [2014](#); Wong et al., [2008](#)). Economic conditions can affect the banking business in the same way as they effect any other industry. Banks play an important role to achieve the objectives of a monetary policy through adjusting the supply of credit, accepting deposits, and via treasury operations. Countries with volatile and unpredictable economies are exposed to financial risks associated with economic conditions (Battaglia et al., [2010](#); Berger et al., [2004](#); Neely & Wheelock, [1997](#)). It can be concluded from the above discussion that to predict and forecast the performance and risk faced by the banking industry in a country, the macroeconomic factors of that particular country should be considered. The following studies helped to understand the relationship between economic factors and banking performance and risk.

Michael ([2014](#)) investigated the impact of macroeconomic variables on bank performance in Nigeria spanning the years 1990-2013. The study used inflation rate and Gross Domestic Product (GDP) as macroeconomic factors and Return on Assets (ROA) and Return on Equity (ROE) for measuring bank profitability. The study showed that GDP has a favorable impact on ROE and Investor Relations (IR), while inflation rates adversely impacts ROE. Pooled Ordinary Least Square (POLS) method was applied. Kanwal and Nadeem ([2013](#)) also used POLS regression method to investigate the impact of macroeconomic variables on the profitability of commercial banks in Pakistan. The study used the data of 18 commercial banks for the years 2001-2011 to determine the impact of inflation, GDP, and real interest rate as economic factors and ROA, ROE, and Equity Multiplier (EM) as the proxies of bank profitability. The study found that real interest rate has a significant positive effect on ROE, ROA, and EM. On the other hand, inflation rate has a significant but negative relationship with all the three indicators of profitability. The impact of GDP was found to be insignificant on profitability.

Anbar ([2011](#)) investigated the bank-specific as well the macroeconomic factors affecting bank profitability in Turkey for the time period 2002-2010. ROA's and ROE's major financial ratios were taken to measure bank profitability as they are the function of bank-specific and macroeconomic elements. By means of standard and reliable statistics, it was revealed that asset size and *Riba*-free profit have more constructive and significant effects

for banks which allows them to make suitable profits. Beside this, the size of a credit portfolio and granting loans have major adverse effects on bank profitability. With respect to macroeconomic variables, real IR affects bank performance positively. The study also revealed that banks can make more profit by increasing bank size and *Riba*-less income which also decreases the credit/asset ratio. Additionally, greater real IR increases bank profitability.

The study conducted by Ali (2011) used the data for the years 2006-2009 to examine the profitability of all commercial banks in Pakistan. The study explored the impact of macroeconomic and bank-related variables on bank profitability in the country. It was found that bank management positively affects ROE and operating efficiency. While, credit risk negatively affects ROE. GDP shows a negative effect on ROA and ROE which were used as proxies of bank profitability. Javed and Basheer (2017) examined bank productivity in Pakistan for the years 2003-2013. The study used bank-specific and macroeconomic elements as independent variables and ROA (which measures the profitability of banks) as the dependent variable. Market concentration, interest rate, real GDP, growth rate, bank expense, and bank fixed assets were used as macroeconomic variables in the study. The results showed a significant impact of macroeconomic variables on the profitability of banks.

Athanasoglou et al. (2014) determined that GDP per capita does not affect bank profitability, while inflation rate and the concentration of banks do. Berger (2008) explained the positive relationship between concentration and profits by lower costs generated due to management or production steps. Inflation affects bank profitability. Indeed, the unstable variability of inflation may lead to cash movement problems for borrowers who may close their arrangement with the bank and lead it to lose its loans.

On the other hand, the study conducted by Simiyu and Ngile (2010) found that GDP per capita has a positive but insignificant relationship with bank profitability. Similarly, a study conducted by Javaid (2011) used a sample of all commercial banks in Pakistan for the time period 2005-2009. POLS method was utilized for data analysis. GDP growth, market capitalization, and inflation were used as macroeconomic factors. ROA, ROE, and return on capital were employed and net interest margin was used to determine bank profitability. The results revealed that bank-specific and macroeconomic variables affect profitability in a significant way.

Impact of Macroeconomic Variables on Islamic Banks

Waemustafa and Sukri (2015) used the macroeconomic factors specifically affecting the banks to determine the credit risk side of both Islamic and non-Islamic banks. Multivariate regression model was used on 15 interest-based banks and 13 *Shariah*-complaint banks in Malaysia from the time period 2000-2010. The results show that bank-specific factors of the risk of credit default distinctively affected the credit risk formation of Islamic and non-Islamic banks. For interest-based banks, loan loss provision, debt-to-total asset ratio, size, earnings management, and liquidity are significant factors that affect the credit risk. For macroeconomic factors and variables, only inflation has a significant impact on credit risk for both Islamic and interest-based banks (Waemustafa & Sukri, 2015).

The study explored the effect of macroeconomic variables and banks' characteristics on bank profitability of Jordanian Islamic banks for the year 2000-2011. Capital adequacy, bank size, total deposit to total asset, and liquidity were used as independent variables, while ROA and ROE were dependent variables that were used to determine banks' effectiveness. The study revealed that bank size and capital adequacy positively affect ROA and ROE. However, total deposit to total asset ratio (isused for influence) affects ROA and ROE negatively. Moreover, liquidity insignificantly affects ROA, although it affects ROE negatively but significantly. Panel data, fixed effect model, and Generalized Least Square (GLS method) were used to check the hypothesis (Al-Qudah & Jaradat, 2013).

A study was executed in Indonesia where there is dual banking-system. The data was collected for the period 2010-2017 on quarterly basis. The study selected endogenous and exogenous variables. Macroeconomic factors were taken as exogenous and risk-taking behavior was taken as an endogenous variable. The study reveals that both macroeconomic and risk-taking behavior affect both Islamic and non-Islamic banks. The study also shows that for risk mitigation, bank characteristics, bank size, and equity to asset ratio are more important. The study uses panel integration approach (Mifrahi & Fakhrunnas, 2018).

The study of Lin et al. (2016) explores the impact of macro-economic variables on the credit risk of both Islamic and conventional banks. The data is collected from the year 2008-2015 for 91 conventional and 11 Islamic banks. The independent variables include industrial production index,

inflation and exchange rate. Dependent variables include non-performing loans to measure the credit risk of banks. Empirical results suggest that Islamic banks are more resistant during crisis, and only two variables (Exchange Rate and MS) which are significant to credit risk in Islamic banks. However, in conventional banks almost all variables are significant. The results of the above studies can be concluded that the impact of macroeconomic factors is more significant for conventional banks as compared to Islamic banks. This phenomenon shows that Islamic banks have more resilience against credit risk.

Research Methodology

Variables and Data

Panel data is used to determine the impact of macroeconomic variables on the risk and performance of Islamic and conventional banks. The target population in this study is comprised of all Islamic and conventional banks in Pakistan. The study used 10-year data spanning 2009-2018. The sample size comprised four (04) Islamic and four (04) conventional banks. Pakistan had four (04) full-fledged Islamic banks during the study period. They were all included in the sample. Whereas, four (04) conventional banks were selected on the basis of their size comparative to Islamic banks. This approach can be useful to make a fair comparison. Bank related data was collected from the annual financial statements of the banks, while data related to macroeconomic variables was obtained from the World Bank database. The dependent variables of the study included Return on Assets (ROA) which measures profitability, loan to total assets ratio which measures the Credit Risk (CR) of banks, and Technical Efficiency (TE) was measured through the DEA method. Independent variables included GDP growth, inflation rate, interest rate, and exchange rate. Bank size was measured through the logarithm of total assets and used as the control variable of the study.

Bank Efficiency

To measure firm efficiency, the researchers used different techniques. Some common techniques used in the literature are financial ratios and Data Envelopment Analysis (DEA). According to Zheka (2005), there are two basic reasons to use technical efficiency in a transition context. Firstly, many company shares do not freely trade due to high rigidity in the stock market. Secondly, technical efficiency helps to foresee the effect of

corporate governance on firm value and allows to investigate the base of the corporate governance problem, particularly where resources are used insufficiently.

Data Envelopment Analysis (DEA)

DEA was developed by Charnes et al. (1978) for efficiency measurement. It uses constant return to scale assumption. This model was extended afterward by Banker and Natarajan (2011) to measure efficiency by using the variable return to scale assumption. The one difference between these two models is the free variable denoted by U_o . DEA has the power to combine the multiple inputs and outputs of a company. These companies or banks are called decision making unit (DMU), and provides a single measure that represents the efficiency between the inputs and outputs of DMU. The study used DEA on an annual basis (long-run) to avoid the short-term behavior of the data that leads to noise.

In the past studies, DEA was used to measure the efficiency of financial and non-financial firms. The current study employed the DEA technical and scale efficiency models to measure the annual technical and scale efficiency of each firm for the period 2005-2010. The study used two DEA models, namely Constant Return to Scale (CCR) model was initially proposed by Banker, Charnes and Cooper and on an assumption that any change in inputs should produce proportional change in outputs. BCC model, on the other hand, formulated based on some changes in CCR model assuming that even if outputs are not proportional to inputs, DMU can even be efficient. We calculate the scale efficiency score by their ratios. Input and output parameter weights are selected to increase the efficiency score of each unit. When efficiency is 1 then DMU is considered to be efficient. The scoring of efficiency varied between 0 and 1. Technical efficiency refers to the firm capacity of production at a given level of input to produce a maximum level of output.

Constant Return to Scale Model or the CCR model is suitable when the firm aims to maximize technical efficiency from a given level of inputs. It may be possible to reduce inputs in order to achieve high efficiency. Banker and Natarajan (2011) developed Variable Return to Scale Model or the BCC Model that is used to achieve a given level of production by a minimum level of inputs. The extended model further decomposes Technical Efficiency (TE) into Pure Technical Efficiency (PTE) and Scale

Efficiency (SE). The current study also used two input variables, namely total assets and total stockholder equity, as well as two output variables, namely total revenue and net profit before tax for the measurement of the technical efficiency of Islamic and conventional banks in Pakistan.

Panel Regression Models

$$ROA_{it} = \alpha + \beta_1(GDP)_{it} + \beta_2(Inflation_rate)_{it} + \beta_3(Interest_rate)_{it} + \beta_4(Exchange_rate)_{it} + \beta_5(Firm_Size)_{it} + \mu_{it}$$

$$TE_{it} = \alpha + \beta_1(GDP)_{it} + \beta_2(Inflation_rate)_{it} + \beta_3(Interest_rate)_{it} + \beta_4(Exchange_rate)_{it} + \beta_5(Firm_Size)_{it} + \mu_{it}$$

$$CR_{it} = \alpha + \beta_1(GDP)_{it} + \beta_2(Inflation_rate)_{it} + \beta_3(Interest_rate)_{it} + \beta_4(Exchange_rate)_{it} + \beta_5(Firm_Size)_{it} + \mu_{it}$$

Where:

ROA = Return on assets

TE = Technical Efficiency

CR = Total debt to total assets

α = Intercept of the equation

β = Coefficient of Independent variables

GDP = GDP of Pakistan in billion US dollar

Inflation rate = Inflation rate of Pakistan

Interest rate = Interest rate of Pakistan

Firm Size = Log of assets of ith bank

μ = Error term of

i = i represent ith bank

t = t represent year

Results and Discussion

The data used in this study is a combination of time series (10-year) data and cross-sectional data collected from four Islamic and four conventional banks. Return on Assets (ROA) is used to measure bank performance. Data Envelopment Analysis (DEA) technique is used to calculate firm efficiency

(technical efficiency), while debt to assets ratio (debt ratio) is used to measure bank credit risk. Various panel data techniques including descriptive statistics, correlation analysis, and OLS regression analysis are used to explore the impact of macroeconomic variables on bank performance, bank efficiency (technical efficiency), and bank credit risk.

Descriptive Statistics of Dependent and Independent Variables

Table 1 displays the mean and standard deviation of all independent and dependent variables as well as the total number of observations used in regression analysis.

Table 1

Descriptive Statistics of Variables

Variables	Mean	Maximum	Minimum	Std. Dev.	Obs
ROA_IB	0.0037	0.0169	-0.029	0.0085	40
ROA_CB	0.00721	0.1256	-0.014	0.0279	40
TE_IB	0.93662	1	0.802	0.054	40
TE_CB	0.79643	0.9925	0.5865	0.0947	40
Credit Risk IB	0.3367	0.4859	0.2103	0.0624	40
Credit Risk CB	0.43993	0.5786	0.2653	0.063	40
GDP	242.6	312	168	47.517	40
Inflation Rate	8.471	17.63	3.8	4.5123	40
Interest Rate	10.576	14.32	7.07	2.8704	40
Exchange Rate	102.356	139.5	84.1	15.359	40
Firm Size	12.34	18.6	2.34	10.23	40

Correlation Analysis

Table 2

Correlation Matrix of Independent Variables

	ROA_IB	GDP	INF_RATE	INT_RATE	EXCH_RATE	ECON_GROWTH	FirmSize
ROA_IB	1						
GDP	0.2579	1					
INFL_RATE	-0.202	-0.882	1				
INT_RATE	-0.136	-0.927	0.9419	1			
EXCH_RATE	0.1774	0.8611	-0.7543	-0.7799	1		
Firm Size	0.0125	0.0014	-0.2453	-0.2356	0.0214	0.2356	1

Table 2 depicts the results of correlation analysis. GDP has a weak and positive correlation of 0.2579 with ROA of Islamic banks. Inflation rate has a weak but negative correlation of -0.202 with ROA. Interest rate has a weak but negative correlation of -0.136 with ROA. Exchange rate has a weak and positive correlation of 0.1774 with ROA. Finally, firm size also has a weak and positive correlation of 0.0125 with ROA.

Panel Regression Analysis

Hausman Test

The following panel data techniques were applied to explore the association of macroeconomic variables with Islamic and conventional banks' performance, technical efficiency, and credit risk. Firstly, random-effects model was applied. Secondly, fixed-effects model was applied. Finally, Hausman test was used to select the appropriate model between random-effects and fixed-effects for regression analysis. The test predicts whether the unique errors are correlated with the regressor. The results showed a significant p -value based on which fixed-effects model was selected for regression analysis.

Regression Results

Table 3

Fixed-Effects Regression Model with Respect to Profitability (ROA)

Variable's Name	Dependent Variable = ROA			Dependent Variable = ROA		
	Islamic Banks			Conventional Banks		
	Coefficient	t -value	p -value	Coefficient	t -value	p -value
GDP	0.0124	2.1245	0.0456	3.6576	5.3455	0.0112
INFL_RATE	-0.03105	-3.254	0.0235	-2.9876	-3.1007	0.0233
INT_RATE	-0.00038	-1.996	0.0499	7.7888	9.0099	0.0067
EXCH_RATE	3.21548	0.1287	0.8984	3.6545	-2.1111	0.0456
Firm Size	5.2546	5.2458	0.0005	8.0998	4.0912	0.0045
C	0.0119	0.2236	0.8245	1.1122	0.1325	0.9965
R -Square	0.631791			0.34436		
Adjusted R -Square	0.536769			0.175163		
F -value	6.648916			2.035256		
Probability (F)	0.000047			0.074817		

Table 3 depicts the impact of macroeconomic variables on the

profitability of Islamic and conventional banks. GDP coefficient value shows a significant and positive relationship of GDP with both Islamic and conventional banks' performance, although the impact is higher on conventional banks as compared to Islamic banks. These results are in line with the studies of Jreisat (2020) and Klein and Weill (2022). Inflation coefficient values indicate a negative but significant relationship between inflation rate and the profitability of both bank types. However, the impact of inflation is more adverse on conventional banks as compared to their Islamic counterparts. Interest rate coefficient value for Islamic banks indicates a negative but significant relationship of interest rate with their profitability, whereas this relationship remains positive with conventional banks. It shows that when interest rate increases the profitability of Islamic banks declines, while the profitability of conventional banks improves. This could be due to different business models that both bank types use. Since Islamic banks mostly use trade-based models, the price of their products cannot be increased with the rise in interest rate. This can adversely affect the profitability of Islamic banks as compared to their conventional counterparts. Exchange rate coefficient value for Islamic banks shows a positive but insignificant relationship of exchange rate with their profitability, while its value for conventional banks shows a negative relationship of exchange rate with their profitability. Finally, firm size coefficient values show a positive and significant impact on the profitability of both bank types. This is also evident from the study of Demsetz et al. (1997).

Table 4
Fixed-Effects Regression Model with Respect to Technical Efficiency

Variable's Name	Dependent Variable = TE			Dependent Variable = TE		
	Islamic Banks			Conventional Banks		
	Coefficient	<i>t</i> -value	<i>p</i> -value	Coefficient	<i>t</i> -value	<i>p</i> -value
GDP	3.2314	0.0025	0.7589	1.2356	3.5245	0.0312
INFL_RATE	-1.2356	-2.9986	0.0498	-1.3256	-4.0312	0.01754
INT_RATE	-0.9868	-1.1254	0.0875	2.1256	5.1124	0.0005
EXCH_RATE	2.3658	0.1025	0.9968	1.2568	0.1287	0.8984
Firm Size	2.3253	4.2355	0.0036	1.9856	4.0912	0.0045
C	2.2365	0.3547	0.5526	2.9856	0.1325	0.9965
<i>R</i> -Square	0.4596			0.493989		
Adjusted <i>R</i> -Square	0.3956			0.363405		
<i>F</i> -value	4.2356			3.78293		
Probability (<i>F</i> -value)	0.0095			0.003371		

Table 4 depicts the impact of macroeconomic variables on the technical efficiency of Islamic and conventional banks. Regression results show that GDP does not have a significant effect on the technical efficiency of Islamic banks. However, in case of conventional banks, the impact of technical efficiency is significant and positive. It indicates that when GDP increases, technical efficiency of conventional banks also improves. It is evident from the results that inflation has a significant and negative effect on the technical efficiency of both bank types. Interest rate, once again, shows an opposite impact on both bank types. Therefore, when interest rate increases, technical efficiency of Islamic banks decreases, although the impact is not significant. On the contrary, increasing interest rate improves the efficiency of conventional banks, significantly. Exchange rate does not show any significant impact on both bank types. When the impact of bank size on their technical efficiency was estimated, it was found that a positive and significant relationship exists with both Islamic and conventional banks. Furthermore, larger banks are more efficient than smaller banks. These results are aligned with the theory that due to economies of scale, larger firms achieve higher efficiency (Hakenes & Schnabel, [2011](#)).

Table 5

Fixed-Effects Regression Model with Respect to Credit Risk (CR)

Variable's Name	Dependent Variable = CR			Dependent Variable = CR		
	Islamic Banks			Conventional Banks		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
GDP	5.2365	0.1294	0.9912	3.2650	0.9985	0.1523
INFL_RATE	-3.2562	-5.9986	0.0211	-2.4488	-3.0099	0.0201
INT_RATE	2.3564	1.1254	0.0965	7.6985	5.0259	0.0075
EXCH_RATE	7.0125	0.9547	0.2012	1.9985	0.3256	0.9965
Firm Size	3.3314	7.2355	0.0019	2.2233	3.0011	0.0079
C	9.2356	0.01254	0.8758	10.2356	0.1522	0.5587
R-Square	0.3579			0.560575		
Adjusted R-Square	0.3125			0.447175		
Durbin Watson test	1.735954			1.373198		
F-value	107.0115			4.943338		
Probability (F-value)	0.000			0.000529		

Table 5 depicts the results of regression model. The results summarize the impact of macroeconomic variables on credit risk of Islamic and conventional banks. GDP does not show any significant impact on the credit risk of either Islamic or conventional banks. Whereas, inflation shows a significant and positive impact on the credit risk of both bank types. It

means that during inflationary times, the credit risk of both bank types increases. This may be because of the higher probability of borrowers to pay-off their debt due to inflationary conditions. These results are in line with the studies of Caglayan and Xu (2016) and Fazio et al. (2015). Interest rate has no significant impact on the credit risk of Islamic banks, whereas it shows a significant and direct relationship with the credit risk of conventional banks. These results indicate that with the increasing interest rate, the credit risk of conventional banks also increases, while there is no such impact on the credit risk of Islamic banks. Exchange rate does not show any significant impact on the credit risk of both banks types, while firm size shows a positive and significant impact on the credit risk of both Islamic and conventional banks. These results point out that larger banks have a higher credit risk as compared to smaller banks. These results are also consistent with previous studies (Demsetz et al., 1997; Terraza, 2015).

Conclusion

This study investigated the relationship between macroeconomic factors and performance, efficiency, and credit risk of Islamic and conventional banks in Pakistan. The first regression model concluded that during high GDP growth, the profitability of both bank types increases, while inflation has a negative impact on the profitability of both bank types. When the impact of interest rate on bank profitability was observed, it was found that increasing interest rates improves the profitability of conventional banks, while the profitability of Islamic banks declines with higher interest rates. On the contrary, bank size showed a favorable impact on the profitability of both bank types.

The second estimation model showed that GDP growth does not affect the technical efficiency of Islamic banks, while the technical efficiency of conventional banks improves with the increase in GDP growth. On the contrary, inflation showed a significant and negative impact on the technical efficiency of both bank types. Interest rates showed a positive impact on the technical efficiency of conventional banks, while it showed no significant effect on Islamic banks' efficiency. Whereas, bank size showed the positive impact on the technical efficiency of both Islamic and conventional banks.

The results of third estimation model showed that GDP growth has no significant impact on the credit risk of both bank types, while inflation showed a significant and positive impact on the credit risk of both bank

types. Interest rate showed no significant impact on the credit risk of Islamic banks, while the impact was adverse on the credit risk of conventional banks. Exchange rate showed no significant impact on the credit risk of both bank types, while larger banks were found to be riskier than smaller banks in both bank types.

Overall, the study found that macroeconomic variables have the same impact on both Islamic and conventional banks, with the exception of interest rate. This is because increasing interest rate has a favorable impact on the profitability and technical efficiency of conventional banks, whereas it declines the profitability of Islamic banks. This adverse impact of interest rate on Islamic banks is may be due to the fixed prices of the products of Islamic banks, such as *murabaha* and *diminishing musharakah*. In countries such as Pakistan, where interest rate tends to increase frequently, risk managers of Islamic banks should address this challenge. New products should be developed which may help to offset the adverse impact of interest rate. This could also be managed through prudent asset liability management and the management of risk sensitive gap between interest sensitive assets and liabilities. Banking regulators should also assist Islamic banks in this regard, keeping in view that the share of Islamic banking is gradually increasing in the country.

Future Research Directions

Future studies can extend the analysis over different time periods to capture the dynamics of the relationship between macroeconomic conditions, profitability, and risk. This longitudinal approach would provide a more comprehensive understanding of how the relationship evolves over economic cycles. Cross-country comparison can also establish new dynamics of this relationship. The relationship between macroeconomic variables and the profitability of different Islamic banking products is another potential area of research.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

The data associated with this study will be provided by the corresponding author upon request.

References

- Alharbi, A. T. (2017). Determinants of Islamic banks' profitability: international evidence. *International Journal of Islamic and Middle Eastern Finance and Management*, 10(3), 331–350. <https://doi.org/10.1108/IMEFM-12-2015-0161>
- Ali, K., Akhtar, M. F., & Ahmed, H. Z. (2011). Bank-specific and macroeconomic indicators of profitability-empirical evidence from the commercial banks of Pakistan. *International Journal of Business and Social Science*, 2(6), 235–242.
- Al-Qudah, A. M., & Jaradat, M. A. (2013). The impact of macroeconomic variables and banks characteristics on Jordanian Islamic banks profitability: Empirical evidence. *International Business Research*, 6(10), 153–162. <http://dx.doi.org/10.5539/ibr.v6n10p153>
- Anbar, A., & Alper, D. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. *Business and Economics Research Journal*, 2(2), 139–152.
- Arias, J. C. (2011). Banking profitability determinants. *Business Intelligence Journal*, 4(2), 209–230.
- Ariss, R. T. (2010). Competitive conditions in Islamic and conventional banking: A global perspective. *Review of Financial Economics*, 19(3), 101–108. <https://doi.org/10.1016/j.rfe.2010.03.002>
- Athanasoglou, P. P., Daniilidis, I., & Delis, M. D. (2014). Bank procyclicality and output: Issues and policies. *Journal of Economics and Business*, 72, 58–83. <https://doi.org/10.1016/j.jeconbus.2013.10.003>
- Badreldin, A. M. (2009). *Measuring the performance of Islamic banks by adapting conventional ratios* (Working Paper No. 16). German University in Cairo. https://web.archive.org/web/20170810034549id_/http://mgt.guc.edu.eg/wpapers/016badreldin2009.pdf
- Banker, R. D., & Natarajan, R. (2011). Statistical tests based on DEA efficiency scores. In W. Cooper, L. Seiford & J. Zhu (Eds.), *Handbook on data envelopment analysis. international series in operations research & management science* (Vol. 164, pp. 273–295). Springer.

https://doi.org/10.1007/978-1-4419-6151-8_11

- Battaglia, F., Farina, V., Fiordelisi, F., & Ricci, O. (2010). The efficiency of cooperative banks: the impact of environmental economic conditions. *Applied Financial Economics*, 20(17), 1363–1376. <https://doi.org/10.1080/09603107.2010.491442>
- Berger, A. N., Hasan, I., & Klapper, L. F. (2004). Further evidence on the link between finance and growth: An international analysis of community banking and economic performance. *Journal of Financial Services Research*, 25(2), 169–202. <https://doi.org/10.1023/B:FINA.0000020659.33510.b7>
- Caglayan, M., & Xu, B. (2016). Inflation volatility effects on the allocation of bank loans. *Journal of Financial Stability*, 24, 27–39. <https://doi.org/10.1016/j.jfs.2016.04.008>
- Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision making units. *European Journal of Operational Research*, 2(6), 429–444. [https://doi.org/10.1016/0377-2217\(78\)90138-8](https://doi.org/10.1016/0377-2217(78)90138-8)
- Chen, Y. K., Shen, C. H., Kao, L., & Yeh, C. Y. (2018). Bank liquidity risk and performance. *Review of Pacific Basin Financial Markets and Policies*, 21(1), Article e1850007. <https://doi.org/10.1142/S0219091518500078>
- Demsetz, R. S., Saidenberg, M. R., & Strahan, P. E. (1997). *Agency problems and risk taking at banks*. Federal Reserve Bank of New York. https://web.archive.org/web/20101206104324id/http://www.newyorkfed.org/research/staff_reports/sr29.pdf
- Derbali, A. (2021). Determinants of the performance of Moroccan banks. *Journal of Business and Socio-Economic Development*, 1(1), 102–117. <https://doi.org/10.1108/JBSED-01-2021-0003>
- Fazio, D. M., Tabak, B. M., & Cajueiro, D. O. (2015). Inflation targeting: Is IT to blame for banking system instability? *Journal of Banking & Finance*, 59, 76–97. <https://doi.org/10.1016/j.jbankfin.2015.05.016>
- Hakenes, H., & Schnabel, I. (2011). Bank size and risk-taking under Basel II. *Journal of Banking & Finance*, 35(6), 1436–1449. <https://doi.org/10.1016/j.jbankfin.2010.10.031>

- Hussain, K., & Muhammad, M. (2022). Performance of Islamic and conventional banks: The impact of basel iii. *Journal of Islamic Business and Management*, 12(1), 32–48. <https://doi.org/10.26501/jibm/2022.1201-004>
- Javaid, S., Anwar, J., Zaman, K., & Ghafoor, A. (2011). Determinants of bank profitability in Pakistan: Internal factor analysis. *Yaşar Üniversitesi E-Dergisi*, 23(6), 3794–3804.
- Javed, M. A., & Basheer, M. F. (2017). Impact of external factors on bank profitability. *EPRA International Journal of Research and Development*, 2(5), 1–11.
- Jreisat, A. (2020). Credit risk, economic growth and profitability of banks. *International Journal of Economics and Business Research*, 20(2), 152–167. <https://doi.org/10.1504/IJEBR.2020.109150>
- Kanwal, S., & Nadeem, M. (2013). The impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan. *European Journal of Business and Social Sciences*, 2(9), 186–201.
- Kasri, R. A., & Azzahra, C. (2020). Do Islamic banks more stable than conventional banks? Evidence from Indonesia. *Journal Ekonomi & Keuangan Islam*, 6(2), 149–164. <https://doi.org/10.20885/jeki.vol6.iss2.art6>
- Khemakhem, S., & Boujelbene, Y. (2015). Credit risk prediction: A comparative study between discriminant analysis and the neural network approach. *Accounting and Management Information Systems*, 14(1), 60–78.
- Klein, P. O., & Weill, L. (2022). Bank profitability and economic growth. *The Quarterly Review of Economics and Finance*, 84, 183–199.
- Lee, K. H., & Ullah, S. (2011). Customers' attitude toward Islamic banking in Pakistan. *International Journal of Islamic and Middle Eastern Finance and Management*, 4(2), 131–145. <https://doi.org/10.1108/17538391111144524>
- Lin, H. Y., Farhani, N. H., & Koo, M. (2016). The impact of macroeconomic factors on credit risk in conventional banks and Islamic banks: Evidence from Indonesia. *International Journal of Financial Research*, 7(4), 105–116.

- Michael, E. I. (2020). An assessment of macroeconomic determinants of bank lending in Nigeria. *African Journal of Economics*, 1(1), 1–20.
- Mifrahi, M. N., & Fakhrunnas, F. (2018). Indonesian Islamic bank's performance under Maqāsid based performance evaluation model (MPEM). *Jurnal Ekonomi & Keuangan Islam*, 4(2), 93–103.
- Nasserinia, A., Ariff, M., & Fan-Fah, C. (2014). Key determinants of Japanese commercial banks performance. *Pertanika Journal of Social Science and Humanities*, 22(1), 17–38.
- Neely, M. C., & Wheelock, D. C. (1997). Why does bank performance vary across states? *Federal Reserve Bank of St. Louis Review*, 79(2), 27–40. <https://doi.org/10.20955/r.79.27-40>
- Oino, I. (2021). Regulatory capital: Implications on credit creation and profitability. *Cogent Economics & Finance*, 9(1), Article e1955470. <https://doi.org/10.1080/23322039.2021.1955470>
- Simiyu, C. N., & Ngile, L. (2015). Effect of macroeconomic variables on profitability of commercial banks listed in the Nairobi securities exchange. *International Journal of Economics, Commerce and Management*, 3(4), 1–16.
- Tabash, M. I., & Dhankar, R. S. (2014). The impact of global financial crisis on the stability of Islamic banks: Empirical evidence. *Journal of Islamic Banking and Finance*, 2(1), 367–388.
- Terraza, V. (2015). The effect of bank size on risk ratios: Implications of banks' performance. *Procedia Economics and Finance*, 30, 903–909. [https://doi.org/10.1016/S2212-5671\(15\)01340-4](https://doi.org/10.1016/S2212-5671(15)01340-4)
- Turner, A. (2012). Credit creation and social optimality. *International Review of Financial Analysis*, 25, 142–153. <https://doi.org/10.1016/j.irfa.2012.09.004>
- van Greuning, H., & Iqbal, Z. (2008). *Risk analysis for Islamic banks*. World Bank Publications. <https://documents1.worldbank.org/curated/en/688471468143973824/pdf/424810PUB00ISB101OFFICIAL0USE0ONLY1.pdf>
- Waemustafa, W., & Sukri, S. (2015). Bank specific and macroeconomics dynamic determinants of credit risk in Islamic banks and conventional banks. *International Journal of Economics and Financial Issues*, 5(2),

476–481.

- Wong, J., Fong, T. P. W., Wong, E. T. C., & Choi, K. F. (2008). Determinants of the performance of banks in Hong Kong. In H. Genberg & C.-H. Hui (Eds.), *The banking sector in Hong Kong: Competition, efficiency, performance and risk* (pp. 50–65). Springer.
- Yu, M., Feng, Z., & Wang, Y. (2022). The business cycles driven by loan defaults via credit creation: An agent-based perspective. *Finance Research Letters*, 48, Article e102846. <https://doi.org/10.1016/j.frl.2022.102846>
- Zainol, Z., & Kassim, S. H. (2010). An analysis of Islamic banks' exposure to rate of return risk. *Journal of Economic Cooperation and Development*, 31(1), 59–84.
- Zheka, V. (2005). Corporate governance, ownership structure and corporate efficiency: The case of Ukraine. *Managerial and Decision Economics*, 26(7), 451–460.